

What does the evidence tell us about

FOOT ORTHOSES FOR RUNNERS

Glen Whittaker



Fitzroy Foot and Ankle Clinic



LA TROBE
UNIVERSITY

Prevention of injury



A woman in a blue long-sleeved shirt and black leggings is running up a wide set of concrete stairs. The stairs are made of large, light-colored stone or concrete blocks. The background is a plain, light-colored wall. The overall tone is slightly desaturated.

Prevention of injury

A close-up, low-angle shot of a person's feet wearing colorful running shoes (yellow, black, and red) on a paved surface. The shoes are positioned in the foreground, with the right shoe slightly ahead of the left. The background is a blurred street scene with parked cars and a building, suggesting an urban environment. The lighting is warm, possibly from a low sun.

Treatment of common injuries

Case-study

- “Jane”
- 37 year old female
- Bulimia
 - recurrent metatarsal stress fractures
- Advice on prevention

Prevention of injury

- 18 randomised trials
 - foot orthoses
 - shock absorbing insoles
- Injury data
 - soft tissue injuries
 - stress fractures
 - specific injuries

Review

Effectiveness of foot orthoses and shock-absorbing insoles for the prevention of injury: a systematic review and meta-analysis

Daniel R Bonanno,^{1,2} Karl B Landorf,^{1,2,3} Shannon E Munteanu,^{1,2} George S Murley,¹ Hylton B Menz^{1,2}

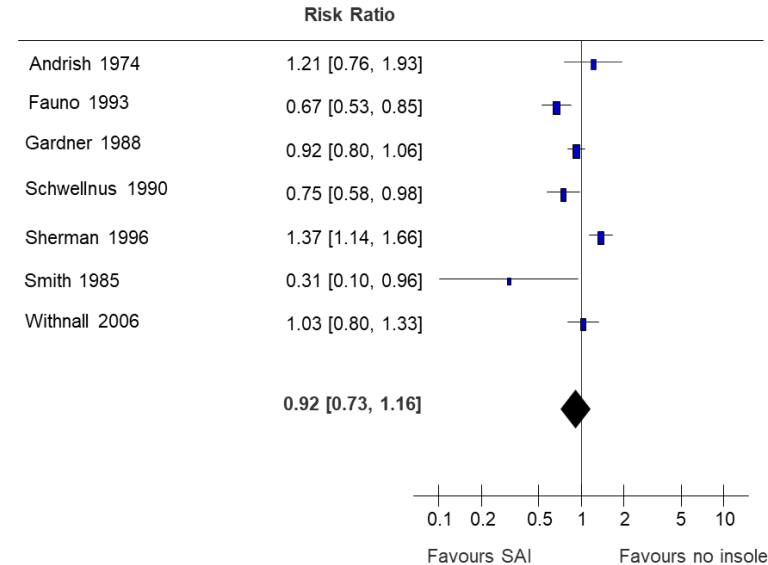
Shock absorbing insoles do NOT reduce the risk of injury

- 7 trials
 - 5 conducted on military recruits
 - 1 conducted on soccer referees
 - 1 conducted on coast guards



Shock absorbing insoles do NOT reduce the risk of injury

- ❌ Overall injury
- ❌ Stress fractures
- ❌ Soft-tissue injuries
- ❌ Specific injuries
- ❌ Quality



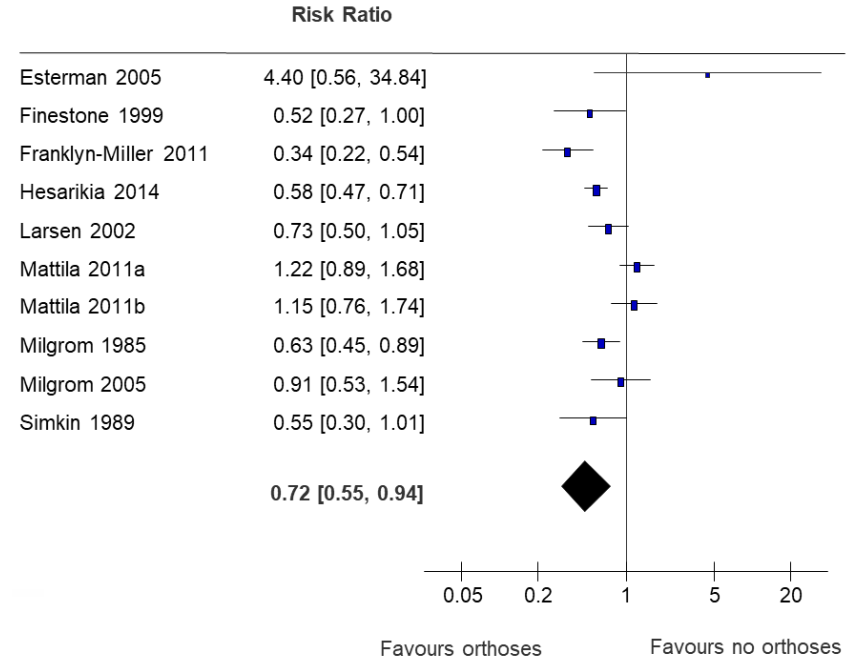
Foot orthoses reduce the risk of injury

- 11 trials
 - all conducted on military recruits
 - 2 evaluated custom-made orthoses
 - 8 evaluated prefabricated orthoses
 - 1 evaluated both



Foot orthoses reduce the risk of injury

- ✓ Overall injury
- ✓ Stress fractures
- ✓ Shin pain
- ✗ Soft-tissue injuries
- ✗ Quality



On Monday morning . . .

- Don't recommend shock absorbing insoles



On Monday morning . . .

- Don't recommend shock absorbing insoles
- Use foot orthoses to prevent:
 - Bone injuries
 - stress fractures
 - shin pain
- Don't use foot orthoses to prevent soft tissue injuries



On Monday morning . . .

- Case-study?



FOOT ORTHOSES FOR THE TREATMENT OF INJURY

1. Medial tibial stress syndrome
2. Plantar heel pain
3. Patellofemoral pain

Case-study

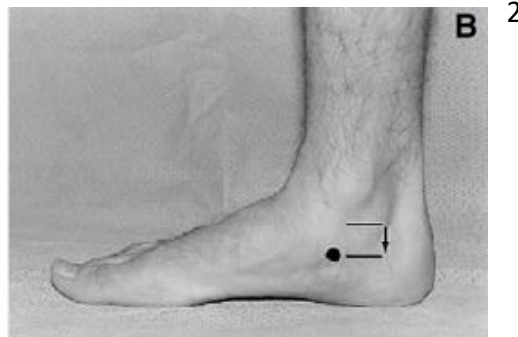
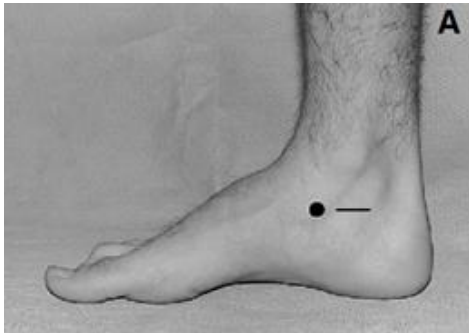
- “Joy”
- 76 year old female
- “desire to run”
- patellofemoral pain

Medial tibial stress syndrome

No randomised trials that have investigated foot orthoses

Medial tibial stress syndrome

- Risk factors
 - A key risk factor is navicular drop¹



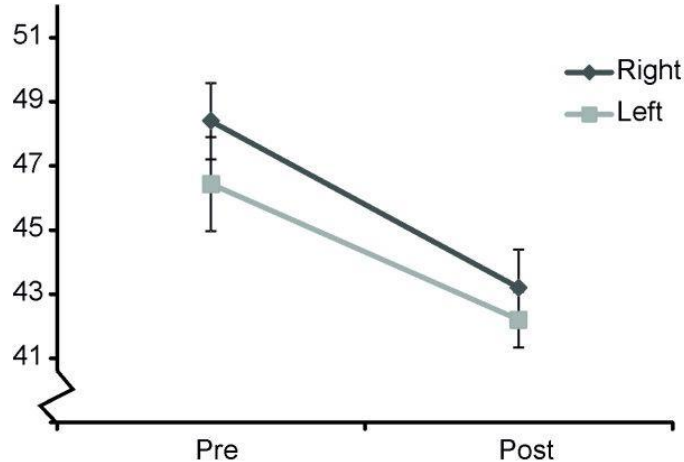
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1. Hamstra-Wright et al. BJSM. 2015

2. Menz. J Am Pod Med Ass. 1998

Medial tibial stress syndrome

- Risk factors
 - average navicular height reduced by 5 mm over half marathon¹



Foot orthoses and stretching may be effective

- Cohort study¹
 - 23 participants with MTSS
 - run > 10 miles/week
 - prefabricated foot orthoses + calf stretches



Foot orthoses and stretching may be effective

- Results
 - 65% had a successful* improvement
 - 83% males; 44% of females
 - Duration of symptoms
 - 181 weeks in the successful group
 - 412 weeks in the unsuccessful group



Plantar heel pain

- Limited evidence in athletic population

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Effectiveness of orthotic shoe inserts in the long-distance runner

MICHAEL L. GROSS,* MD, LANCE B. DAVLIN, MD, AND PHILIP M. EVANSKI, MD



Plantar heel pain

- 347 runners treated with orthoses¹
 - 75% had resolution or great improvement

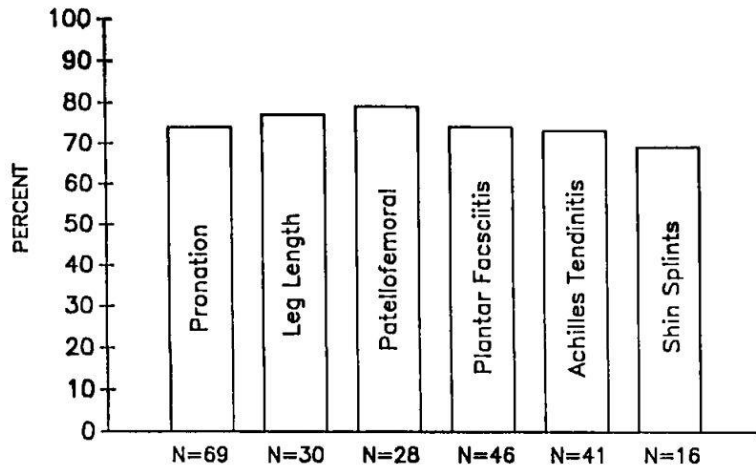


Figure 2. The percent of runners with complete relief or great improvement by presenting diagnosis.



Foot orthoses reduce plantar heel pain

- Foot orthoses in a non-athletic population¹

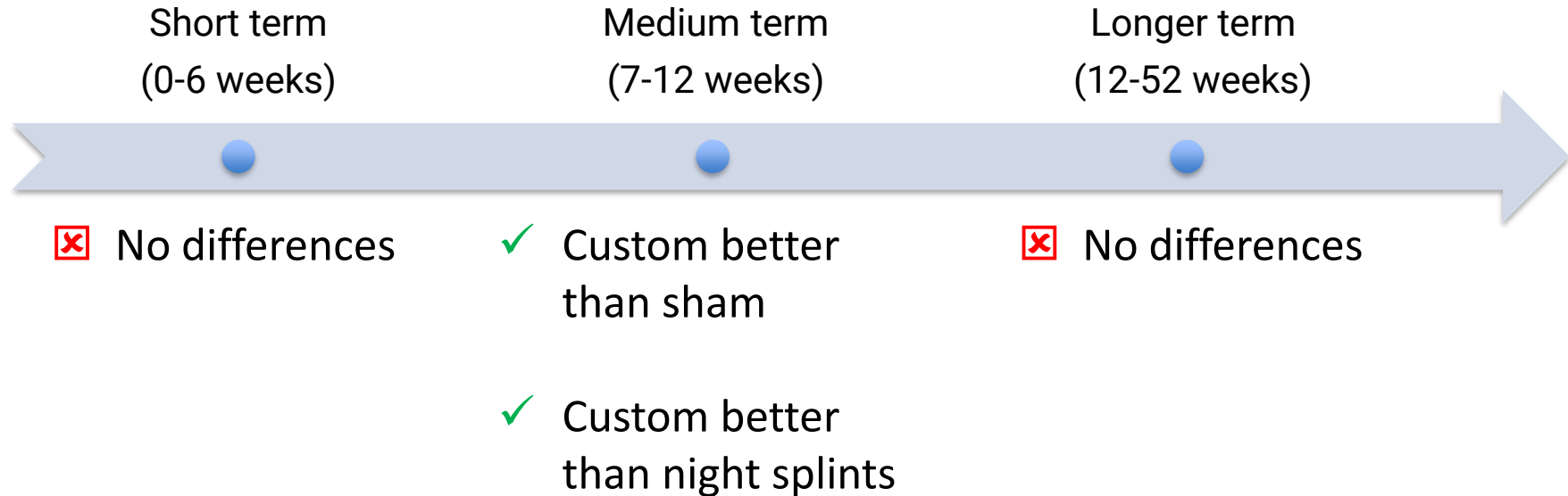
Review

Foot orthoses for plantar heel pain: a systematic review and meta-analysis

Glen A Whittaker,^{1,2} Shannon E Munteanu,^{1,2} Hylton B Menz,^{1,2} Jade M Tan,^{1,2}
Chantel L Rabusin,^{1,2} Karl B Landorf^{1,2}

Foot orthoses reduce plantar heel pain

- Results for pain¹



Foot orthoses reduce plantar heel pain

Participant characteristics	
No. of participants	1,660
% female	67% (range 23-89)
Mean age	47 (range 41-59)
Mean BMI	30 kg/m ² (range 28-33)

Patellofemoral pain

- 3 good quality randomised trials
 - 1 trial in athletic population¹

RESEARCH ARTICLE

Altering Knee Abduction Angular Impulse Using Wedged Insoles for Treatment of Patellofemoral Pain in Runners: A Six-Week Randomized Controlled Trial

Ryan T. Lewinson^{1,2,3,*}, J. Preston Wiley^{1,3,4}, R. Neil Humble³, Jay T. Worobets¹, Darren J. Stefanyshyn^{1,2}

1 Human Performance Laboratory, Faculty of Kinesiology, University of Calgary, Calgary, Alberta, Canada, **2** Biomedical Engineering Program, Schulich School of Engineering, University of Calgary, Calgary, Alberta, Canada, **3** Cumming School of Medicine, University of Calgary, Calgary, Alberta, Canada, **4** Sport Medicine Centre, Faculty of Kinesiology, University of Calgary, Calgary, Alberta, Canada

* lewinson@ucalgary.ca

Foot orthoses reduce patellofemoral pain

- 27 runners randomised to:
 - 3 mm lateral wedge
 - 6 mm medial wedge
- Follow-up at 6 weeks
- Results
 - clinically meaningful pain reduction in both groups
 - no difference between the groups



Foot orthoses reduce patellofemoral pain

- Non-athletic population
- Single-blind, randomised trial

Original article

A randomised control trial of short term efficacy of in-shoe foot orthoses compared with a wait and see policy for anterior knee pain and the role of foot mobility

Kathryn Mills,^{1, 2} Peter Blanch,² Priya Dev,³ Michael Martin,³ Bill Vicenzino¹

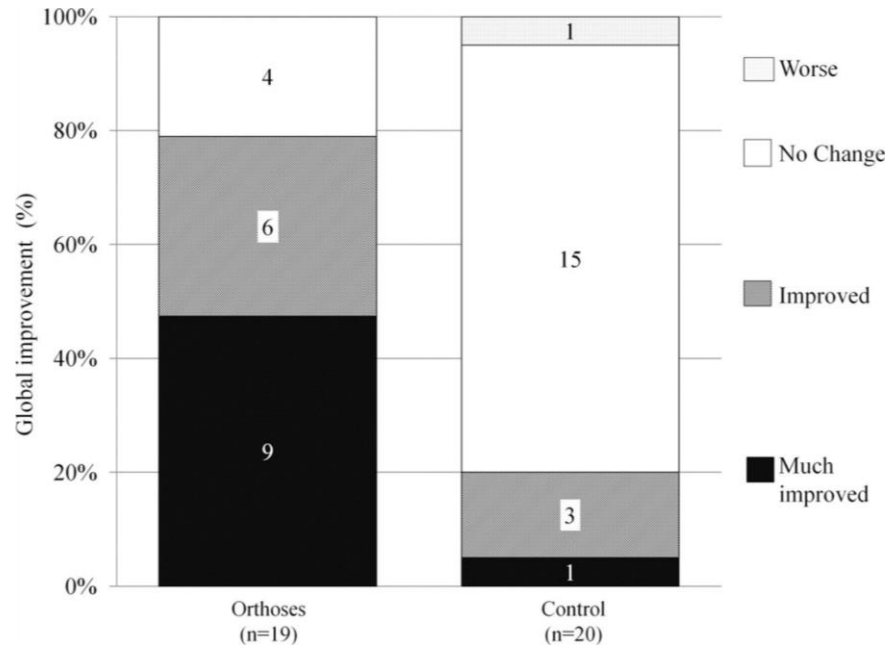
Foot orthoses reduce patellofemoral pain

- 40 participants randomised to:
 - prefabricated foot orthoses
 - wait-and-see
- Follow-up at 6 weeks
- Primary outcome
 - global improvement



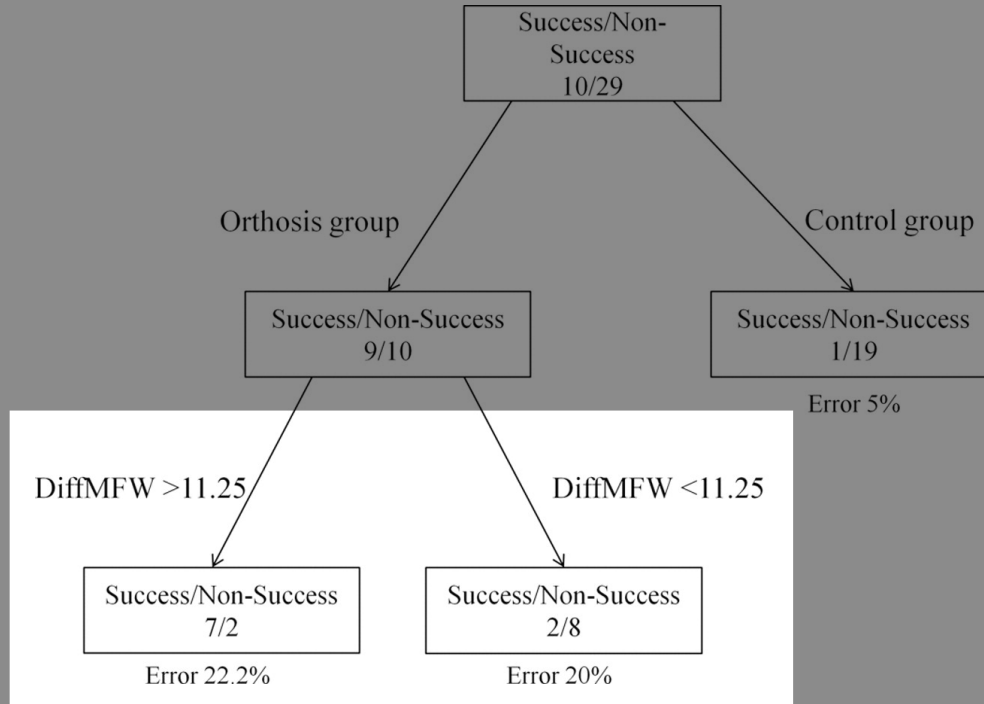
Foot orthoses reduce patellofemoral pain

- Results



Foot orthoses reduce patellofemoral pain

- Results



Foot orthoses reduce patellofemoral pain

A clinical prediction rule for identifying patients with patellofemoral pain who are likely to benefit from foot orthoses: a preliminary determination

Bill Vicenzino,¹ Natalie Collins,¹ Joshua Cleland,²⁻⁴ Thomas McPoil^{1,5}



Foot orthoses reduce patellofemoral pain

Consensus statement

2018 Consensus statement on exercise therapy and physical interventions (orthoses, taping and manual therapy) to treat patellofemoral pain: recommendations from the 5th International Patellofemoral Pain Research Retreat, Gold Coast, Australia, 2017

Natalie J Collins,^{1,2} Christian J Barton,^{2,3} Marienke van Middelkoop,⁴ Michael J Callaghan,⁵ Michael Skovdal Rathleff,⁶ Bill T Vicenzino,¹ Irene S Davis,⁷ Christopher M Powers,⁸ Erin M Macri,^{9,10} Harvi F Hart,^{2,11} Danilo de Oliveira Silva,^{2,12} Kay M Crossley²

On Monday morning . . .

- Who knows if you have a patient with MTSS?
 - perhaps use navicular drop as a guide
- Use foot orthoses for plantar heel pain
 - unclear for an athletic population?
- Use foot orthoses for patellofemoral pain
 - especially in those with greater midfoot mobility



On Monday morning . . .

- Case-study?





Fitzroy Foot and Ankle Clinic

THANK YOU.

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